

CLAIMS

What is claimed is:

- 1 1. A method for automatically setting output power levels of optical transmitters in an
2 optical communications arrangement having at least a first and a second node, wherein the
3 transmitter of the first node is optically coupled to a receiver in the second node, and the
4 transmitter in the second node is optically coupled to a receiver in the first node, comprising:
5 transmitting respective sequences of power-level messages from the transmitters to the
6 receivers, wherein each message in a sequence includes output-power code that indicates an
7 output power level used by the transmitter to transmit the message, and each transmitter uses
8 increasing power levels to transmit each power-level message in the sequence;
9 detecting power levels at which the power-level messages are received by the
10 receivers; and
11 when a receiver receives a power-level message at a power level that satisfies a
12 selected power level, automatically setting an output power level of the coupled transmitter to
13 the output power level indicated in the power-level message.
- 1 2. The method of claim 1, further comprising at each receiver:
2 detecting a power level at which a power-level message is first received;
3 setting the selected power level as a function of the power level at which a power-level
4 message is first received.
- 1 3. The method of claim 2, further comprising setting the selected power level a selected
2 quantity above the power level at which the power-level message is first received.
- 1 4. The method of claim 1, wherein a transmitter and a receiver in the same node are local
2 relative one to another, a transmitter and a receiver in different nodes are remote relative one
3 to another, and the power-level message that satisfies the selected power level is a satisfactory
4 power-level message, further comprising:
5 providing a receiver-initialization complete signal to the local transmitter when the
6 local receiver receives the satisfactory power-level message;

7 transmitting, in response to the receiver-initialization complete signal, a transmit-
8 initialization-complete message from the local transmitter to the remote receiver for setting
9 the output power level of the remote transmitter, wherein the transmit-initialization-complete
10 message includes the output-power code from the satisfactory power-level message.

1 5. The method of claim 4, further comprising:
2 providing a transmit-initialization-complete signal from the remote receiver to the
3 remote transmitter in response to receipt of the transmit-initialization-complete message; and
4 setting, in response to the transmit-initialization-complete signal, the output power
5 level of the remote transmitter to the power level indicated by the output-power code in the
6 transmit-initialization-complete message.

1 6. The method of claim 5, further comprising at each receiver:
2 detecting a power level at which a power-level message is first received;
3 setting the selected power level as a function of the power level at which a power-level
4 message is first received.

1 7. The method of claim 6, further comprising setting the selected power level a selected
2 quantity above the power level at which the power-level message is first received.

1 8. An apparatus for automatically setting output power levels of optical transmitters in an
2 optical communications arrangement having at least a first and a second node, wherein the
3 transmitter of the first node is optically coupled to a receiver in the second node, and the
4 transmitter in the second node is optically coupled to a receiver in the first node, comprising:
5 means for transmitting respective sequences of power-level messages from the
6 transmitters to the receivers, wherein each message in a sequence includes output-power code
7 that indicates an output power level used by the transmitter to transmit the message, and each
8 transmitter uses increasing power levels to transmit each power-level message in the
9 sequence;
10 means for detecting power levels at which the power-level messages are received by
11 the receivers;

12 means, responsive to receipt by a receiver of a power-level message at a power level
13 that satisfies a selected power level, for automatically setting an output power level of the
14 coupled transmitter to the output power level indicated in the power-level message.

1 9. A circuit arrangement for automatically setting output power levels of optical
2 transmitters in an optical communications arrangement, comprising:

3 a first node having a first transmitter, a first receiver, and a first control circuit coupled
4 to the first transmitter and to the first receiver;

5 a second node having a second transmitter, a second receiver, and a second controller
6 coupled to the second transmitter and to the second receiver, wherein the second transmitter is
7 optically coupled to the first receiver of the first node, and the second receiver is optically
8 coupled to the first transmitter of the first node;

9 wherein the first and second transmitters are configured to transmit respective
10 sequences of power-level messages to the second and first receivers responsive to the first and
11 second control circuits, each power-level message in a sequence transmitted at an increasing
12 power level and including an output-power code that indicates an output power level used to
13 transmit the message;

14 wherein the first and second receivers are configured to detect power levels at which
15 the power-level messages are received; and

16 wherein the first and second control circuits are configured to determine when power
17 levels at which power-level messages are received satisfy respective, selected power levels
18 and automatically set output power levels of the first and second transmitters to power levels
19 indicated in the power-level messages.

1 10. The circuit arrangement of claim 9, wherein a power-level message that satisfies a
2 selected power level is a satisfactory power-level message,

3 wherein the first receiver is further configured to provide a first receiver-initialization
4 complete signal to the first transmitter when the first receiver receives a first satisfactory
5 power-level message, and the second receiver is further configured to provide a second
6 receiver-initialization complete signal to the second transmitter when the second receiver
7 receives a second satisfactory power-level message; and

8 wherein the first transmitter is further configured to transmit, in response to the first
9 receiver-initialization complete signal, a first transmit-initialization-complete message to the
10 second receiver for setting the output power level of the second transmitter, the first transmit-
11 initialization-complete message including the output-power code from the first satisfactory
12 power-level message, and the second transmitter is further configured to transmit, in response
13 to the second receiver-initialization complete signal, a second transmit-initialization-complete
14 message to the first receiver for setting the output power level of the first transmitter, the
15 second transmit-initialization-complete message including the output-power code from the
16 second satisfactory power-level message.

1 11. The circuit arrangement of claim 10,

2 wherein the first receiver is configured to provide a first transmit-initialization-
3 complete signal to the first control circuit in response to receipt of the second transmit-
4 initialization-complete message, and the second receiver is configured to provide a second
5 transmit-initialization-complete signal to the second control circuit in response to receipt of
6 the first transmit-initialization-complete message; and

7 wherein the first control circuit is configured to set, in response to the first transmit-
8 initialization-complete signal, the output power level of the first transmitter to the power level
9 indicated by the output-power code in the second transmit-initialization-complete message,
10 and the second control circuit is configured to set, in response to the second transmit-
11 initialization-complete signal, the output power level of the second transmitter to the power
12 level indicated by the output-power code in the first transmit-initialization-complete message.